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EXAMINER	
SOLOMON, GARY L	
ART UNIT	**PAPER NUMBER**
2615	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/472,635	Applicant(s) HONEY ET AL.	
	Examiner Gary L Solomon	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31 and 35-53* is/are rejected.

7)☒ Claim(s) *32-34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

Allowable Subject Matter

1. Claims 32-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

2. The following is a statement of reasons for the indication of allowable subject matter:

In line 7, claim 32, the phrase "a second gyro coupled to said camera assembly, said second gyro capable of measuring camera attitude information in a third plane for at least a portion of said camera assembly, said first gyro measures camera attitude information in a fourth plane for at least a portion of said camera assembly, said third plane is different from said fourth plane; and a second sensor coupled to said camera assembly, said first sensor measures movement of said movable portion with respect to said fixed portion along a first axis, said second sensor measures movement of said moveable portion with respect to fixed portion along a second different axis, said first axis is different from said second axis."

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 6 through 8, 12 ,and 47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 6 recites the limitation "said first encoder" in line 2 of Claim 6. There is insufficient antecedent basis for this limitation in the claim.

6. Claims 7 and 8 are confusing. It isn't clear how a fixed object can have roll and pitch.

7. Claim 12 recites the limitation "said first encoder" in line 5 of Claim 12. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 47 recites the limitation "said step of determining" in line 3 of Claim 47. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 43 through 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Lowe (US 5,462,275).

For claims 43 through 47, refer to Column 11, Line 5, to Column 12, Line 28.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-15, , 17, 19, 20, 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crain (US) in view of Yoshiro (JP 09-133964) further in view of Reister (3,769,710).

For claim 1, Crain discloses a system for using attitude sensors with a camera, said camera being part of a camera assembly (Figure 3), said assembly including a movable portion (Figure 3, Element 48 and above), said system comprising: a first sensor (Figure 3, Element 48) coupled to said camera assembly (Figure 3, Element 48), Lines 19-48) said first sensor measures movement of a movable portion.

Crain does not disclose that the camera assembly has a fixed portion, the movement of the portion being relative thereto. However, it is well known in the art to include as part of a camera assembly a gimbal mechanism that permits a greater number of degrees of freedom of camera movement as taught by Yoshira (Figures 1, 3, and 13 of Yoshira), gimbal mechanisms including a fixed portion, as shown in Figure 6 of Reister (Figure 6, Element 41, which is a fixed portion relative to ring 39). Providing a gimbal mechanism in Crain between the tripod and the movable portion would clearly enable the camera movement having more degrees of freedom, as taught by Yoshiro. Therefore, it would have been obvious to one ordinary skill in that at the time of the invention to provide a gimbal mechanism in Crain in order to increase the degree of freedom in camera movement.

In such a configuration, the movement of the movable portion is clearly relative to that of the fixed portion since the movable and fixed portions are separate from each other. An inclinometer is included in Reister Figure 6, Element 47) that measures attitude information of a portion of the camera assembly.

For claim 2, Crain, Yoshiro, and Reister disclose all the previous limitations of claim wherein, said first sensor measures rotation of said movable portion about a first axis (Figure 3, The Vertical Axis passing through the center of the camera).

For claim 3, Crain, Yoshiro, and Reister disclose all the limitations of claim 2, wherein said first inclinometer of Reister measures a component of the movement of said first axis.

For claim 4, Crain, Yoshiro, and Reister disclose that the first sensor is a gyro compass (Column 3, Line 38), but implies that other types of sensors may be used (Column 3, Lines 38-39). Official notice is given that optical encoders are well known and can be used for measuring camera movement. Therefore, an optical encoder would have been recognized by one skilled in the art as an obvious variation of the gyro used in Crain.

For claim 5, Reister discloses a second inclinometer coupled to said camera assembly, said first inclinometer and said second inclinometer are used to measure an orientation of said camera assembly Figure 3, Element 48).

For claim 6, Crain discloses a first sensor, which is coupled to said movable portion Reister discloses said first inclinometer is coupled to said fixed portion; and said second inclinometer is coupled to said fixed portion (Figure 6, Elements 47 and 48).

For claim 7, Crain discloses said first sensor measures panning of said camera (Column 1, lines 45-53 First Plane); and Reister discloses the first inclinometer, which measures roll of said fixed portion; and said second inclinometer measures pitch of said portion.

For claim 8, Crain discloses said first sensor measures tilting of said camera (Column 1, Lines 45-53 2nd plane); and Reister discloses the first inclinometer, which measures roll of said fixed portion; and said second inclinometer measures pitch of said portion.

For claim 9, Crain uses data from the first sensor to describe the camera orientation (Column 1, Lines 57-59). It is clear in the combination of Crain, Yoshiro, and Reister data form the first and second inclinometer would be combined therewith.

For claim 10, as discussed s above, Crain, Yoshiro, and Reister disclose data from said first sensor is combined with the data from first inclinometer and second inclinometer, said combined data is used to transform a location in a first coordinate system to a position in a second coordinate system (Column 1, Lines 60-64).

For claim 11, Crain discloses a second sensor coupled to said camera assembly (Figure 3, Element 48V), said first sensor measures movement of said movable portion about a second axis (Figure 6, Element 48 H), and Reister discloses said first inclinometer and said second inclinometer measure movement of said first axis and said second axis (Figure 6, Element 47 and 48).

For claim 12, Crain discloses a processor programmed to determine attitude parameters describing an orientation of the camera (Figure 1, Element 62 and 66 and Column 1, Lines 45-53). It is clear that in the combination of Crain, Yoshiro, and Reister, the processor receives data from the first inclinometer and the first sensor and would be programmed to determine attitude parameters describing an orientation of the camera based on stat therefrom.

For claim 13, Crain discloses that the processor uses attitude parameters to transform a location in first coordinate system to a position in a second coordinate system (Column 1, Lines 54-64).

For claim 14, the fixed portion of Crain, Yoshiro, and Reister includes a tripod head interface (the gimball) of Yoshiro including the fixed portion shown in Reister. Crain, Yoshiro, and Reister also disclose that the movable portion includes a portion of a tripod head (Element 48 of Crain) and a camera as seen in Figure 3 of Crain. Crain discloses that the first sensor is coupled to the tripod head (See Figure1 of Crain) and the first inclinometer is coupled the tripod head interface as shown in Figure 6 of Reister.

For claim 15, Crain, Yoshiro, and Reister disclose sensor electronics located with said camera assembly and first inclinometer; said sensor electronics reads data from said first sensor and said first inclinometer and packages said data for transmission to a processor (Crain, Figure 4).

For claim 17, Crain, Yoshiro, and Reister disclose all the previous limitations and Reister also discloses a second inclinometer coupled to said camera assembly, the first inclinometers mounted in a first plane, the second inclinometer is mounted on a second plane, where the first plane is orthogonal to the first plane as shown in Figure 6.

Crain teaches a second sensor coupled to said movable portion, said first sensor and said second sensor are optical encoders, said first sensor measures rotation of said movable portion about a first axis, and said second sensor measures rotation of said movable portion about a second axis, and the said first and second inclinometers measure movement of the first and second axis (See Claim 11).

Crain also discloses a processor programmed to combine data form the first inclinometer, second inclinometer, where the first and second sensor describe orientation of the camera. Henceforth, the processor communicates with first and second inclinometer and first and second sensor.

For claim 19, see examiner's comments for claims 1 and 15. Furthermore, combing said data from said first sensor with said data from said first inclinometer is an obvious addition that inherently already exists. Acquired data must be combined in order to process and use the information to transform camera orientation.

For claim 20, Crain discloses using multivariable equations in order to transform coordinate positions of camera orientation. Creating one or more transformation matrices using data form said first sensor and data from second inclinometer are analogous to using multivariable equations since matrices are a representation of multivariable equations.

For claim 22, see examiner's comments for claims 2 and 3.

For claim 24, Reister discloses the sensing of data form the first inclinometer and Crain discloses the sensing of data from said first gyro and combining the data together in the transformation process.

13. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crain (US) in view of Yoshiro (JP 09-133964) further in view of Reister (3,769,710) in further view of Rosser (US 5,426,933).

For claim 21, Crain, Reister and Yoshiro all teach the previous limitations; wherein said step of combing includes converting said location to a position is based on a step of combing. However, they lack teaching of adding a graphic to said video image from said camera at said position.

Nevertheless Rosser (US 5,264,933) teaches an apparatus and method for adding a graphic to a video image in television at a selected position. (Abstract). Therefore, it would have been obvious at the time of the invention to combine the apparatus and method of Rosser with the teachings of Crain, Yoshiro, and Reister in order to enable the addition images in such a manner that they appear to be part of the original video.

14. Claims 16 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crain (US) in view of Yoshiro (JP 09-133964) in further view of Reister (3,769,710) in further view of Lowe (US 5,462,275).

For claims 16 and 23, Crain, Reister and Yoshiro all teach the previous limitations including the processor being located as a first location (Crain; Fig 4) and performing the signal combining. However, they lack teaching of adding said data from said first sensor and said first inclinometer to an audio signal for transmission. However, Lowe teaches computer graphics encoding common motion data (pan, tilt, and zoom) in to a digital signal or position code, and recording this position code into an audio channel in transferring that to a desired location from a location. (Column2, Lines 23-29). Such an arrangement is well known in the art as being convenient for communicating camera data in a video environment. Therefore it would have been obvious to one of ordinary skill in he art at the time of the invention to transmit camera motion data in Crain, Yoshiro, and Reister in eh audio channel in order to use a well known method of processing camera motion format.

15. Claims 18, 25-31, 35-38, 40, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crain (US 4,084,184) in view of Yoshiro (JP 09-133964) in further view of Reister (3,769,710) in further view of Matsuzawa (US 5,534,967).

For claim 18, Crain, Yoshiro, and Reister disclose all the previous limitations. They lack a first gyro in communication with said processor; and a second gyro in communication with said processor, said processor combines data form said first gyro and said second gyro with data from first inclinometer, said second inclinometer, said first and said second sensor. However, Matsuzawa discloses a shake detection and compensations system using high pass filter arithmetic means that includes a first and second gyro to detect image shake (Figure 4A, Element 12A and 12 B). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure the camera system of

Crain, Yoshiro, and Reister with the shake detection circuit of Matsuzawa in order to provide an image shake detection and compensation circuit so the video or image would be very stable.

For claim 25, see examiners comments for Claim 18.

For claim 26, Crain, Yoshiro, Reister, and Matsuzawa disclose all the previous limitations. They lack specific teachings of fiber optic gyros. Fiber Optic Gyros are a form of a gyroscope, which is disclosed by Matsuzawa (Figure 4A, Elements 12A and 12 B). Nevertheless, fiber optic gyroscopes or ring laser gyroscopes are well known to one of ordinary kill in the art. Furthermore, the use of one fiber gyroscope to detect a single axis of rotation is also well known to one of ordinary skill in the art. Official notice is herby taken that the replacement of one fiber optic gyroscope would have been obvious to one of ordinary skill in the art at the time of the invention.

For claim 27, Crain, Yoshiro, Reister, and Matsuzawa disclose all the previous limitations, and Crain discloses said first sensor measures rotation of said movable portion of first axis (Figure 3, Axis Z; and Column 2 Line 31-34).

For claim 28, Crain, Yoshiro, Reister and Matsuzawa disclose all the previous limitations, wherein said first gyro measures information about a first axis (Crain, Figure 3 and Matsuzawa Fig 4, Element 12B).

For claim 29, Crain, Yoshiro, Reister, and Matsuzawa disclose all the previous limitations and Matsuzawa also discloses a second gyro coupled to the said camera assembly capable of measuring attitude information of at least a portion of the camera assembly. The data from Matsuzawa's first and second gyro (Figure 4, Element 12A and 12B) is combined with Crain first sensor to describe an orientation of the camera assembly.

For claim 30, Crain, Yoshiro, Reister, and Matsuzawa disclose the previous limitations, further comprising: a processor, said processor receives and combines data from said first sensor and said first gyro to describe an orientation with in the camera (Crain, Figure 4).

For claim 31, Crain, Yoshiro, Reister, and Matsuzawa disclose all the previous limitations, further comprising a first inclinometer (Matsuzawa, Figure 4, Element 12A) coupled to said camera assembly; and a processor (Crain, Figure 4), said processor receives and combines data from said first sensor, said first gyro and said first inclinometer to describe an orientation of said camera.

For claim 35 and 36, Crain, Yoshiro, Reister, and Matsuzawa disclose all the previous limitations. Matsuzawa also discloses a first circuit compensating for offset in said first circuit and for reducing error drift in said first gyro (Column 13, Lines 23-42)

For claim 37, Crain, Yoshiro, Reister, and Matsuzawa disclose a method for using attitude sensors with a camera, said camera being part of a camera assembly, said assembly including a fixed portion and a movable portion (Crain, Figure 4), said system comprising: sensing data from a data sensor, first sensor measures movement of said movable portion relative to said fixed portion; sensing data from a first gyro (Matsuzawa, Figure 4), said first gyro measures attitude information of at least a portion of said camera assembly; and combining data from said first sensor with data from said first gyro.

For claim 38, Crain, Yoshiro, and Reister, and Matsuzawa disclose the previous limitations, and Matsuzawa reduces errors to drift in the first gyro (Column 13, Lines 23-42).

For claim 40, Crain, Yoshiro, and Reister, and Matsuzawa disclose the previous limitations, and Matsuzawa discloses sensing data from a second gyro; Crain discloses said step of combining which includes combining said data (Crain, Figure 4) form Matsuzawa's first and second gyro (Figure 4, Element 12A and 12B) with data from the first sensor.

For claim 42, Crain, Yoshiro, and Reister, and Matsuzawa disclose the previous limitations, and Matsuzawa discloses compensating for offset of first gyro (Column 14, Lines 23-42).

16. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crain (US 4,084,184) in view of Yoshiro (JP 09-133964) in further view of Reister (3,769,710) in further view of Matsuzawa (US 5,534,967) in further view of Rosser (US 5,264,933).

For claim 39, Crain, Yoshiro, Reister, and Matsuzawa disclose the previous limatioatins and also teach the selection and conversion a location in a scene to a position in a video image from the camera, and the step of converting is based on a step of combining (See Claim 21).

However, they lack adding a graphic to the video image from the camera at the said position.

Nevertheless, Rosser-as previously discussed-teaches the insertion of a graphic at desired position in a video image from a camera (Abstract). Therefore, it would have been obvious to combine the teachings of Rosser with the method of Crain, Yoshiro, Reister, and Matsuzawa in order to enable the addition images in such a manner that they appear to be part of the original video.

17. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crain (US 4,084,184) in view of Yoshiro (JP 09-133964) in further view of Reister (3,769,710) in further view of Matsuzawa (US 5,534,967) in further view of Lowe (US 5,462,275).

For claim 41, Crain, Yoshiro, Reister, and Matsuzawa disclose the previous limitations. However, they lack adding said data form said first sensor with data from said first inclinometer to an audio signal for transmission to a first location, a first processor is located at said first location, a first processor is located at the first location, and performs the step of combining.

Nevertheless, Lowe discloses the combination of an audio signal with camera attitude information as taught in Column 2, Line 23-29 and the transmission to a location where a processor is located (Crain, Figure 4). It is also taught in Figure 4 of Crain the step of combining as previously stated.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure an arrangement of combination to Crain, Yoshiro, Reister, Matsuzawa, and Lowe in order to produce a stable and accurate video image with the addition of audio signals.

18. Claims 48-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crain (US 4,084,184) in view of Lowe (US 5,462,275).

For claim 48, Crain discloses a system for using attitude sensors with a camera, said camera having a camera video signal in communication with remotely located production equipment, the system comprising: a first camera attitude sensor. However, Crain lacks and an audio signal generator in communication with a said first camera attitude sensor.

Nevertheless, Lowe teaches an audio signal generator in a camera system, which generates an audio signal for transmission. Configuring an arrangement of Crain's system with Lowe's system in order to produce audio signal in communication with attitude sensors would have been obvious to one of ordinary skill in the art at the time of the invention.

For claim 49, it is well known in the art that an audio signal includes a modulation circuit.

For claim 50, it is well known in the art that a data extractor must extract an audio signal and a data extractor must also extract data from camera attitude sensors.

For claim 51, a data extractor must inherently include a demodulation circuit.

For claim 52, Crain and Lowe disclose all the previous limitations, wherein: said camera includes an audio input and audio output (); said audio signal generator is in communication with audio input; and said audio signal generator is in communication with said remotely controlled production equipment (Column 11, Line 50-53; Note an audio cannel has an input and output. It must have a path to insert information on the channel and a pathway to remove it).

For claim 53, Crain discloses a camera attitude sensor as in inclinometer (Column 3, Line 40).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L Solomon whose telephone number is (703)-305-4370. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christensen, B Andrew can be reached on (703)-308-9644.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Or faxed to:

(703) 872-9314, (for informal or draft communications, please label "Proposed" or "Draft")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the customer service number **(703) 306-0377**.

August 25, 2003

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